What is claimed is:

1. A polymer electrolyte fuel cell stack comprising:

a plurality of unit cells, each of which is provided with:

a membrane electrode assembly having a pair of electrodes between which a solid polymer membrane is sandwiched; and

separators between which the membrane electrode assembly is sandwiched;

a gas supply manifold supplying reaction gases to each of the plurality of unit cells;

a gas exhaust manifold through which the reaction gases are exhausted; and

a pressure loss control mechanism controlling the reaction gases passing trough the gas supply manifold, respective flow passages of the plurality of unit cells and the exhaust manifold to control pressure loss of at least one of the gas supply manifold and the gas exhaust manifold corresponding to the flow rates of the reaction gases in a way to establish a predetermined ratio between the pressure loss of at least one of the gas supply manifold and the gas exhaust manifold and pressure loss in the respective flow passages of the plurality of unit cells.

2. The polymer electrolyte fuel cell stack according to claim 1, wherein the pressure loss of at least one of the gas supply manifold and the gas exhaust manifold is controlled so as to decrease as the flow rates of the reaction gases decreases.

3. The polymer electrolyte fuel cell stack according to claim 1, wherein the pressure loss control mechanism includes a movable member disposed in at least one of the gas supply manifold and the gas exhaust manifold.

4. The polymer electrolyte fuel cell stack according to claim 3, wherein moving the movable member allows control of at least one of an area of each of supply ports through which the reaction gases are supplied from the gas supply manifold to the plurality of unit cells and an area of each of exhaust ports through which the reaction gases are exhausted from the plurality of unit cells to the gas exhaust manifold.

5. The polymer electrolyte fuel cell stack according to claim 4, wherein the pressure loss control mechanism has through-holes, associated with at least one of the supply ports and the exhaust ports, whereby moving the pressure loss control mechanism allows control of at least one of the area of each of the supply ports and the area of each of the exhaust ports.

6. The polymer electrolyte fuel cell stack according to claim 5, wherein a reduction ratio of at least one of the area of each of the supply ports and the area of each of the exhaust ports resulting from movement of the movable member is set depending upon each of the plurality of unit cells.

7. The polymer electrolyte fuel cell stack according to claim 1, wherein the pressure loss control mechanism includes a plurality of movable members disposed in at least one of the gas supply manifold and the gas exhaust manifold, and the plurality of movable members are associated with at least one of supply ports through which the reaction gases are supplied from the gas supply manifold to the plurality of unit cells and exhaust ports through which the reaction gases are exhausted from the plurality of unit cells to the gas exhaust manifold, whereby moving the movable members allows at least one of an area of each of the supply ports, through which the reaction gases are supplied from the gas supply manifold to the plurality of unit cells, and an area of each of the exhaust ports, through which the reaction gases are exhausted from the plurality of unit cells to the gas exhaust manifold, to be independently controlled.

8. The polymer electrolyte fuel cell stack according to claim 7, wherein a reduction ratio of at least one of the area of each of the supply ports and the area of each of the exhaust ports resulting from movement of the movable members is independently controlled in accordance with each of the plurality of unit cells.

9. The polymer electrolyte fuel cell stack according to claim 3, wherein the movable member is disposed in opposition to at least one of supply ports, through which the reaction gases are supplied from the gas supply manifold to the plurality of unit cells, and exhaust ports, through which the reaction gases are exhausted from the plurality of unit cells to the gas exhaust manifold, to variably

control a distance between the movable members and at least one of the supply ports and the exhaust ports.

10. The polymer electrolyte fuel cell stack according to claim 9, wherein the distance between the movable member and at least one of the supply ports and the exhaust ports is set depending upon each of the plurality of unit cells.

11. The polymer electrolyte fuel cell stack according to claim 1, wherein the pressure loss control mechanism includes a plurality of movable members associated with at least one of the gas supply manifold and the gas exhaust manifold, and the plurality of movable members are disposed in opposition to at least one of supply ports, through which the reaction gases are supplied from the gas supply manifold to the plurality of unit cells, and exhaust ports, through which the reaction gases are exhausted from the plurality of unit cells to the gas exhaust manifold, to allow a distance between the plurality of movable members and at least one of the supply ports and the exhaust ports to be independently controlled.

12. The polymer electrolyte fuel cell stack according to claim 11, wherein the distance between the plurality of movable members and at least one of the supply ports and the exhaust ports is independently controlled in accordance with each of the plurality of unit cells.

13. The polymer electrolyte fuel cell stack according to claim 1, further comprising a clogged condition detector detecting a clogged condition resulting from condensed water in the flow passage of at least one unit cell of the plurality of unit cells,

wherein the pressure loss control mechanism control the pressure loss so as to alleviate the clogged condition.

14. The polymer electrolyte fuel cell stack according to claim 1, further comprising a residual hydrogen detector detecting a residual hydrogen quantity in the flow passage of each of the plurality of unit cells,

wherein the pressure loss control mechanism controls the pressure loss such that the smaller the residual hydrogen quantity in a unit cell among the plurality

of unit cells is, the larger a quantity of hydrogen is supplied to the unit cell.

15. A polymer electrolyte fuel cell stack comprising:

a plurality of unit cells, each of which is provided with:

a membrane electrode assembly having a pair of electrodes between which a solid polymer membrane is sandwiched; and

separators between which the membrane electrode assembly is sandwiched;

a gas supply manifold supplying reaction gases to each of the plurality of unit cells;

a gas exhaust manifold through which the reaction gases are exhausted; and

pressure loss control means for controlling the reaction gases passing trough the gas supply manifold, respective flow passages of the plurality of unit cells and the exhaust manifold to control pressure loss of at least one of the gas supply manifold and the gas exhaust manifold corresponding to the flow rates of the reaction gases in a way to establish a predetermined ratio between the pressure loss of at least one of the gas supply manifold and the gas exhaust manifold and pressure loss in the respective flow passages of the plurality of unit cells.

16. A method of controlling pressure loss in a polymer electrolyte fuel cell stack having a plurality of unit cells, each of which is provided with: a membrane electrode assembly having a pair of electrodes between which a solid polymer membrane is sandwiched; and separators between which the membrane electrode assembly is sandwiched; and a gas supply manifold supplying reaction gases to each of the plurality of unit cells; a gas exhaust manifold through which the reaction gases are exhausted, the method comprising:

controlling the reaction gases passing trough the gas supply manifold, respective flow passages of the plurality of unit cells and the exhaust manifold to control pressure loss of at least one of the gas supply manifold and the gas exhaust manifold corresponding to the flow rates of the reaction gases in a way to establish a predetermined ratio between the pressure loss of at least one of the gas supply manifold and the gas exhaust manifold and pressure loss in the respective

flow passages of the plurality of unit cells.